No. 7200025

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Asgrow Seed Company

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME ASD DESCRIPTION OF WHICH ARE CONTAINED IS THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IS SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER TJJE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY I'ROTECTIOS IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF seventeen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IS A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING I-I'. OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BEAN

'Thor'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 9th *day of* May *in the year of our Lord one thousand nine hundred and* seventy-four

Attest:

L. R. Rollin
Commissioner
Plant Variety Protection Office

Earl L. Butz

Exhibit A Origin and Breeding History

Bean Thor PV#72025

Thor originated from a cross between Bush Blue Lake 272 x Bush Blue Lake 274 made in 1961. Single plant selections were made during the period 1962 through 1964. In 1965 the first trial and seed stock increase was made. Trials, selection, and seed stock increases were made from 1966 through 1970. The experimental designation XP297 was applied in 1966. The variety was named Thor in August 1971 and an application for PVP was filed at that time.

Thor has been uniform and stable from 1966 and has a normal rate of mutation to flat pods and strings. No other off-type are know to occur to a significant degree.

FORM GR- 470
(12-15-72)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

FORM APPROVED
OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See *Reverse.*

1. VARIETY NAME OR TEMPORARY DESIGNATION	2. KIND NAME	FOR OFFICIAL USE ONLY
Thor	Garden Bean	PV NUMBER 72025

3. GENUS AND SPECIES NAME	4. FAMILY NAME *(Botanical)*	FILING DATE	TIME
Phaseolus vulgaris	Leguminosae	8/27/71	11 A.M. ~~P.M.~~
	5. DATE OF DETERMINATION	FEE RECEIVED	BALANCE DUE
	1966	$ 750.00	$
		$	$
		$	$

6. NAME OF APPLICANT(S)	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*	8. TELEPHONE AREA CODE AND NUMBER
Asgrow Seed Company	Kalamazoo, Michigan 49001	(616) 382-4000

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. STATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Delaware	22 March, 1968

12. Name and mailing **address of applicant** representative(s), if any, to serve in this application and receive **all** papers:

Allen Trotter
Asgrow Seed Company
Kalamazoo, Michigan 49001

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

[X] 13A. Exhibit A, Origin and Breeding History of the Variety (See ***Section 52 of the Plant Variety Protection Act.)***

[X] 13B. Exhibit B, Botanical Description of the Variety

[X] 13C. Exhibit C, Objective Description of the Variety

[X] 13D. Exhibit D, Data Indicative of Novelty

[X] 13E. Exhibit E, Statement of the Basis of Applicant's **Ownership**

14A. Does the applicant(s) specify that **seed** of this variety be sold by variety name only as a class of certified seed? *(See Section 83(a). (If "Yes," answer 14B and 14C below.).* [ ] YES [X] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations? [ ] YES [ ]

14C. If "Yes," to 14B, how many generations of production **beyond** breeder seed?
NO [ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

The applicant declares that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) of this sexually-reproduced novel plant ***variety believes that the variety is distinct, uniform. and stable*** as ***required in Section 41 and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.***

Applicant is informed that false representation herein can jeopardize protection and result in penalties.

March 22. 1974
(DATE)

Allen Trotter
(SIGNATURE OF APPLICANT)

1

(DATE)

(SIGNATURE OF APPLICANT)

Exhibit B Botanical Description of the Variety

Bean Thor PV#72025

Thor is a snapbean in the Bush Blue Lake class. It is generally adapted but like all Bush Blue Lakes it is sensitive to environmental conditions and its commercial usage is more restricted than its range of adaptation. It responds to high rates of available nitrogen with excessive plant growth. Thor is late in maturity, being a day or so later in maturity than Bush Blue Lake 274. With beans of this type maturity is difficult to measure because rate of seed development is very slow and pod quality is retained into 6 and 7 sieve beans. Based on sieve size it is earlier than maturity based on seed length.

The plant is determinate and is first erect but falls over from the weight of developing pods and may be considered sprawling by harvest time. Spread is greater than height (51 cms vs 66 cms). Flower and pod position are both high contributing to the weight problem.

Leaves are wrinkled, dull, large and dark green. They are of average thickness and slightly pubescent with the center leaf taper pointed. Flowers are white and are borne on average length racemes. Green pods are long -- about 15 cm, 92 mm in width, and 98 mm thick. They are dark green, round when young, becoming creasebacked with age. The pods are slightly curved, sparsely pubescent and usually without constrictions. The spur is slightly curved. Pods have a dull, not shiny, smooth surface. Pod flesh is dark and firm and holds exceptionally well. The rate of seed development is extremely slow and results in an exceptionally meaty bean even in large sieve size and this constitutes its most distinguishing characteristic. In some tests it has produced over 80% 5 sieve and over pods with a seed length of about 10 mm and a seed percentage under 8%. Pods are stringless and almost fiberless. Pods produce about 6 seed. The variety is adapted to mechanical harvest.

Seed color is white without mottling or splashing and the hilar ring is not present. Seed are elliptical, kidney type, and round in cross section. Seed are relatively large; 100 seed weigh about 38 grms. Seed are 13 mm long, 6 mm wide, and 6 mm thick. W/T ratio is 100. Thor is resistant to common NY15 strains of bean virus 1.

10. ANTHOCYANIN: *(1 = Absent 2 = Present):*

[1] FLOWERS [1] STEMS [1] PODS [1] SEEDS [1] LEAVES

11. DISEASE RESISTANCE *(0 = Not tested; 1 = Susceptible; 2 = Resistant):*

[0] RUST *(Specify race)* _____
[0] BACTERIAL WILT
[0] ANTHRACNOSE
[0] SOUTHERN BEAN MOSAIC
[0] CURLY TOP
[0] POWDERY MILDEW
[0] HALO BLIGHT
[0] ALFALFA MOSAIC VIRUS
[0] POD MOTTLE VIRUS
[0] ROOT KNOT NEMATODE

Note: All data reported in this description was obtained in field or green house plantings at Asgrow Research Center (ARC), Twin Falls, Idaho. Information not recorded in the normal plant breeding operation, may be from different years or special green-house plantings.

[0] ANGULAR LEAF SPOT
[2] COMMON BEAN MOSAIC
[0] YELLOW BEAN MOSAIC
[0] FUSARIUM ROOT ROT
[2] N.Y. 15 BEAN MOSAIC
[0] BEAN MOSAIC VIRUS 4
[0] FUSCOUS BLIGHT
[0] ALFALFA MOSAIC VIRUS 2
[0] RED NODE VIRUS
[0] OTHER *(Specify)* _____

12. INSECT RESISTANCE: *(0 = Not tested; 1 = Susceptible; 2 = Resistant)*

[0] APHIDS
[0] POD BORER
[0] THRIPS
[0] SEED CORN MAGGOT
[0] LEAF HOPPERS
[0] LYGUS
[0] WEAVILS
[0] OTHER *(Specify)* _____

13. PHYSIOLOGICAL RESISTANCE: *(0 = Not tested; 1 = Susceptible; 2 = Resistant)*

[0] HEAT [0] COLD [0] DROUGHT [0] OTHER *(Specify)* _____

REFERENCES: The following publications may be used as a reference in completing this form:

1. Beans of New York. Vol. 1 Part II of Vegetables of New York. U.P. Hedrick et al. J. B. Lyon Company, Albany, N.Y. 1931.

2. Yarnell, S. H., Cytogenetics of the Vegetable Crops IV. Legumes. Bot. Rev. 31:247 - 330. 1965.

3. USDA Yearbook of Agriculture. 1937.

COLOR: Nickerson's or any recognized color fan may be used to determine the colors.

Various characteristics identified and described above can be significantly influenced by factors such as environment (moisture, temperature, soil type, disease, etc.) as well as population density.

Exhibit D Data Indicative of Novelty

Bean 'Thor' PV# 72025

'Thor' is a Bush Blue Lake and most nearly resembles 'Bush Blue Lake 274'. It is distinguished from Bush Blue Lake 274 by its later maturity, being about two days later when maturity is based on seed length. Pods are somewhat larger and have a slower rate of internal breakdown because of slower seed development. Thor has the slowest rate of seed development of any commercial variety. Mature seed are slightly larger than those of 'Bush Blue Lake 274'.

'Thor' also resembles 'Bush Blue Lake Supreme' from which it can be distinguished by being later in maturity, with a larger plant size. 'Thor' also has a weaker plant with a greater tendency to sprawl at maturity.

Revised Exhibit D

EXHIBIT E

Basis of Ownership

Thor was developed by Dr. W. H. Pierce, retired, a former employee of Asgrow Seed Company and Dr. C. G. Briggs, a current Asgrow employee. By agreement between the employee and Asgrow Seed Company, all rights to any invention, discovery, or development made by the employee while employed by Asgrow Seed Company, were assigned to Asgrow Seed Company with no rights of any kind retained by the employee.

Bean - Thor
Asgrow Seed Company
August 16, 1971

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-12
(11-15-72)

EXHIBIT C
(Bean)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

DATE: Jan 24, 1973

OBJECTIVE DESCRIPTION OF VARIETY

BEAN (*PHALEOLUS VULGARIS*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)
Asgrow Seed Company

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)
9620-190-1
Kalamazoo, Michigan 49001

FOR OFFICIAL USE ONLY

PVPO NUMBER
72025

VARIETY NAME OR TEMPORARY DESIGNATION
Thor

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. TYPE:

[1] 1 = SNAPBEAN 2 = GREEN SHELL 3 = DRY EDIBLE 4 = MULTIPURPOSE

2. SEASON AND REGION OF ADAPTABILITY IN THE U.S.:

[2] Grows best during: 1 = SPRING 2 = SUMMER 3 = FALL 4 = WINTER

[6] Best adapted in: 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST 5 = SOUTHWEST 6 = MOST REGIONS

3. MATURITY (*Days from seeding to first harvest*):

[7][6] GREEN PODS [ ][ ] GREEN SHELLS [ ][ ] DRY SEEDS

[ ][ ] NO. DAYS EARLIER THAN ---------- [ ]
[0][1] NO. DAYS LATER THAN ---------- [7]

1 = TENDERCROP 2 = KENTUCKY WONDER 3 = KINGHORN WAX
4 = WHITE KIDNEY 5 = MICHELITE 62 6 = DWARF HORTICULTURAL
7 = BUSH BLUE LAKE 8 = OTHER (*Specify*)

4. PLANT:

[1] SHOULD BE 2 Rds
1 = DETERMINATE, ERECT BUSH 2 = DETERMINATE, SPRAWLING BUSH
3 = DETERMINATE, SEMIPOLE 4 = INDETERMINATE, POLE

[0][5][1] CM. HEIGHT OR LENGTH OF VINE FROM PRIMARY LEAF NODE

[ ][ ][ ] NUMBER PRIMARY BRANCHES PER MAIN STALK

[6][6] CM. SPREAD

[ ][ ] NUMBER INTERNODES ON MAIN STALK BETWEEN PRIMARY LEAF AND BASE OF TERMINAL INFLORESCENCE

[1] Branching habit: 1 = COMPACT 2 = OPEN

[ ][ ] CM. LENGTH OF FIRST INTERNODE ABOVE PRIMARY LEAF

[ ][ ] MM. STALK DIAMETER ABOVE FIRST TRIFOLIATE LEAF

[2] Main stalk: 1 = BRITTLE 2 = WIREY [1] 1. STOUT 2. THIN

[2] Flower position:
[2] Pod Position:
1 = LOW, CONCENTRATED 2 = HIGH, CONCENTRATED 3 = SCATTERED

5. LEAVES:

[2] 1 = SMOOTH 2 = WRINKLED [1] 1 = DULL 2 = GLOSSY [2] Thickness: 1 = THIN 2 = MEDIUM 3 = THICK

[3] Size: 1 = SMALL (*Earliwax*) 2 = MEDIUM 3 = LARGE (*Tendercrop*) [ ] CM. PETIOLE LENGTH (*To basal leaflets of first trifoliate leaf*)

[2] Tip shape of center leaflet: 1 = ROUNDED 2 = TAPER POINTED 3 = SHARP POINTED

[2] PUBESCENCE - Dorsal:
[ ] PUBESCENCE - Ventral:
1 = NONE 2 = SLIGHT 3 = CONSIDERABLE

[3] Color: 1 = LIGHT GREEN (*Bountiful*) 2 = MEDIUM GREEN 3 = DARK GREEN (*Bush Blue Lake*)

6. FLOWERS:

[1] Color: 1 = WHITE 2 = CREAM 3 = PINK 4 = LILAC 5 = PURPLE
6 = OTHER *(Specify)*_____

[2] Racemes: 1 = LONG 2 = MEDIUM 3 = SHORT [ ] NUMBER FLOWERS PER RACEME

7. FRESH PODS: ***(Edible maturity, averages for 10 pods)***

[3] Color: 1 = LIGHT GREEN *(Bountiful)* 2 = MEDIUM GREEN *(Tendergreen)* 3 = DARK GREEN *(Wade)*
4 = LIGHT YELLOW *(Brittlewax)* 5 = GOLDEN YELLOW *(Cherokee Wax)* 6 = GREEN-RED VARIAGATED *(Horticultural)*
7 = OTHER *(Specify)* _____

[1][5] CM. LENGTH [9][2] MM. WIDTH *(Between sutures)* [9][8] MM. THICKNESS [9][4] WIDTH / THICKNESS X 10

[4] Cross section pod shape: 1 = FLAT 2 = OVAL 3 = CREASEBACK 4 = ROUND

[2] Curvature: 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = CURVED

[2] Pubescence: 1 = NONE 2 = SPARSE 3 = CONSIDERABLE

[1] Constrictions: 1 = NONE 2 = SLIGHT 3 = DEEP

[2] Spur: 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = CURVED

[2] Surface: 1 = SHINY 2 = DULL

[1] Surface: 1 = SMOOTH 2 = BLISTERED

[2] Pod flesh: 1 = LIGHT 2 = DARK

[1] Pod flesh: 1 = FIRM 2 = WATERY

[ ] MM. SPUR LENGTH

[2] Suture string: 1 = PRESENT 2 = ABSENT

[1] Fiber: 1 = NONE 2 = SPARSE 3 = CONSIDERABLE

[1] Seed development: 1 = SLOW 2 = MEDIUM 3 = FAST

[6] NUMBER OF SEEDS PER POD

[ ] NUMBER PODS PER PLANT *(Once over harvest)*

[ ] NUMBER MARKETABLE PODS PER PLANT *(Once over harvest)*

[1] Machine harvest: 1 = ADAPTED 2 = NOT ADAPTED

8. SEED COAT COLOR:

[1] 1 = MONOCHROME 2 = POLYCHROME

[1] 1 = SHINY 2 = DULL

[1] Primary color: 1 = WHITE 2 = YELLOW 3 = BUFF 4 = TAN
[ ] Secondary color: 5 = BROWN 6 = PINK 7 = RED 8 = PURPLE
9 = BLUE 10 = BLACK 11 = OTHER *(Specify)*_____

[ ] Color pattern: 1 = SPLASHED 2 = MOTTLED 3 = STRIPED 4 = FLECKED 5 = DOTTED

[ ] Secondary color location: 1 = HILAR RING 2 = HILAR SURFACE 3 = STROPHIOLE 4 = MICROPYLE 5 = SIDES 6 = DORSAL SURFACE 7 = NOT RESTRICTED TO ANY AREA 8 = COMBINATION OF LOCATIONS *(Specify)*_____

[1] Hilar ring: 1 = NOT PRESENT 2 = NARROW 3 = BUTTERFLY SHAPED

[1] Vein-like under coat pattern: 1 = ABSENT 2 = PRESENT

9. SEED SHAPE AND SIZE:

[1] Hilum view: 1 = ELLIPTICAL 2 = OVAL 3 = ROUND

[3] Side view: 1 = OVAL 2 = ROUND 3 = KIDNEY 4 = TRUNCATE ENDS

[4] Cross section: 1 = ELLIPTICAL 2 = OVAL 3 = CORDATE 4 = ROUND

[34] GM. WEIGHT PER 100 SEEDS

[4] Classification: 1 = PEA 2 = MEDIUM 3 = MARROW 4 = KIDNEY 5 = PINTO

[0][6] MM. WIDTH *(Dorsal to ventral)*

[0][6] MM. THICKNESS *(Side to side)*

[1][3] MM. LENGTH

[1][0][0] WIDTH / THICKNESS X 10

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, 6525 Belcrest Road, Hyattsville, Maryland 20782. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Insert the date the applicant determined that he had a new variety based on the definition in Section 41 (a) of the Act and decision is made to increase the seed.

13a First, give the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method. Second, give the details of subsequent stages of selection and multiplication. Third, indicate the type and frequency of variants during reproduction and multiplication and state how these variants may be identified. Fourth, provide evidence on stability.

13b First, give any special characteristics of the seed and of the plant as it passes through the seedling stage, flowering stage and the fruiting stage. Second, describe the mature plant and compare it with a similar commercial variety grown under the same conditions, and indicate the differences.

13c A supplemental form will be furnished by the PVPO to describe in detail a variety for each kind of seed.

13d Provide complete data indicative of novelty. Seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty may be submitted. Seeds submitted may be sterile.

13e Indicate whether applicant is the actual breeder, the employer of the breeder, the owner through purchase or inheritance, etc.